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Dietary protein and bone health: a systematic review and meta-analysis.

Darling AL, Millward DJ, Torgerson DJ, Hewitt CE, Lanham-New SA.

BACKGROUND:

There has been a resurgence of interest in the controversial relation between dietary protein and bone health.

OBJECTIVE:

This article reports on the first systematic review and meta-analysis of the relation between protein and bone health in healthy human adults.

DESIGN:

The MEDLINE (January 1966 to September 2007) and EMBASE (1974 to July 2008) databases were electronically searched for all relevant studies of healthy adults; studies of calcium excretion or calcium balance were excluded.

RESULTS:

In cross-sectional surveys, all pooled *r* values for the relation between protein intake and bone mineral density (BMD) or bone mineral content at the main clinically relevant sites were significant and positive; protein intake explained 1-2% of BMD. A meta-analysis of randomized placebo-controlled trials indicated a significant positive influence of all protein supplementation on lumbar spine BMD but showed no association with relative risk of hip fractures. No significant effects were identified for soy protein or milk basic protein on lumbar spine BMD.

CONCLUSIONS:

A small positive effect of protein supplementation on lumbar spine BMD in randomized placebo-controlled trials supports the positive association between protein intake and bone health found in cross-sectional surveys. However, these results were not supported by cohort study findings for hip fracture risk. Any effects found were small and had 95% CIs that were close to zero. Therefore, there is a small benefit of protein on bone health, but the benefit may not necessarily translate into reduced fracture risk in the long term.